MASSACHUSETTS WATER RESOURCES AUTHORITY CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report

January 1, 2007

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Report Summary:

Highlights	**January 1, 2005**	**January 1, 2007**
Contributions		
Funding Schedule FY 2008	$4,233,329	$4,233,329
Funding Schedule FY 2009	4,381,285	5,314,218
Funded Ratios		
GAS No. 25	83.6%	82.7%
Participants		
Actives	1,150	1,127
Retirees and Beneficiaries	227	236
Vested	10	0
Inactives	174	150
Disabled	28	31
Total	1,589	1,544
Payroll		
Payroll of Active Members	$65,789,878	$75,444,127
Average Payroll	57,209	66,942
Normal Cost		
Employer	1,430,121	1,415,227
Employee	5,624,210	6,527,514
Administrative Expenses	0	0
Total	7,054,331	7,942,741
Actuarial Accrued Liabilities		
Actives	140,599,887	186,408,780
Retirees, Beneficiaries, Disabilities and Inactives	60,662,216	69,552,919
Total	206,348,711	255,961,699
Actuarial Value of Assets	172,511,736	211,715,711
Unfunded Actuarial Accrued Liabilities	$33,836,975	$44,245,988

Introduction

This report presents the findings of an actuarial valuation as of January 1, 2007, of the Massachusetts Water Resources Authority Contributory Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2007.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Massachusetts Water Resources Authority Contributory Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2007.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The cost of these benefits has been assumed by the State under Proposition Two and One-Half.

Actuarial Experience

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

In 2007 the Retirement Board decided to change the actuarial cost method from the aggregate cost method to the individual entry age normal cost method. Under the entry age normal cost method, an unfunded actuarial accrued liability is calculated and reported on the GASB disclosure statement. Though the aggregate cost method was used in the 1/1/2005 valuation, and hence an accrued liability was not calculated, calculations were performed to determine that the unfunded accrued liability would have been $33,836,975 under the entry age normal cost method.

During the last two years, the total unfunded actuarial accrued liability under the entry age normal cost method increased by 30.8% to $44,245,988. The increase is the result of net unfavorable actuarial experience during the preceding two years. The sources of the (gain)/loss are as follows:

Investment	(1,530,691)
Salary Increases	778,693
New Participants	1,068,032
Active – Retirements	(2,206,011)
Active – Terminations	2,350,610
Active - Mortality	(219,335)
Active - Disabilities	(437,503)
Inactive - Mortality and data adjustments	3,463,487
Other, including service buybacks	6,726,294
Total (gain)/loss	9,993,576

Actuarial Costs and Liabilities:

Normal Costs

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

Table I

	January 1, 2005	January 1, 2007
Superannuation	$5,139,428	$6,068,566
Termination	958,478	827,067
Death	485,318	541,671
Disability	471,107	505,437
Administrative Expenses	0	0
Total Normal Cost	7,054,331	7,942,741
% of Pay	10.7%	10.5%
Employee Contributions	5,624,210	6,527,514
% of Pay	8.5%	8.7%
Employer Normal Cost	$1,430,121	$1,415,227
% of Pay	2.2%	1.9%

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Present Value of Actuarial Accrued Liabilities

The actuarial accrued liabilities (AAL) represents today's value of all benefits based on the past service of the actives and inactives. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

Table II

	January 1, 2005	January 1, 2007
Actives		
Superannuations	$124,246,772	$167,572,799
Termination	4,706,733	4,006,031
Death	6,829,911	8,631,532
Disability	4,816,471	6,198,418
Retirees and Inactives		
Retirees and Beneficiaries	51,377,309	53,780,178
Vested	0	0
Terminated (Refund)	5,086,608	5,263,118
Disabled	9,284,907	10,509,623
Total	$206,348,711	$255,961,699

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Present Value of Future Benefits

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

Table III

	January 1, 2005	January 1, 2007
Actives		
Superannuation	$173,010,825	$221,136,907
Termination	8,628,523	7,249,919
Death	11,156,823	13,219,282
Disability	9,093,990	10,714,019
Retirees and Inactives		
Retirees and Beneficiaries	51,377,309	53,780,178
Vested	0	0
Terminated (Refund)	5,086,608	5,263,118
Disabled	9,284,907	10,509,623
Total	$267,638,985	$321,873,046

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Funded Status and Appropriations:

Market Value of Plan Assets

The trust fund composition on a market value basis is shown in Table IV.

Table IV

	January 1, 2005	January 1, 2007
Cash equivalents	$1,442,388	$3,451,612
Short term investments	795,621	0
Fixed income securities	62,649,602	76,692,620
Equities	71,399,958	80,260,779
International	27,102,375	39,701,312
Real Estate	10,627,348	10,714,547
Venture Capital	0	0
Other	2,573,675	14,375,189
Accounts receivable	1,322	163,341
Accounts payable	(10,222)	(318,407)
Accrued income	1,650	13,930
Total Market Value	$176,583,717	$225,054,924
Total Actuarial Value	$172,511,736	$211,715,711

Actuarial Value of Assets

The actuarial value of assets is determined by projecting the market value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.0%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 10%. The calculation of the actuarial value of assets as of January 1, 2007 is presented in Table V.

Table V

		January 1, 2007
(1)	Market value at January 1, 2006	$195,034,272
(2)	2006 Contributions	$11,664,912
(3)	2006 Payments	($7,628,476)
(4)	Net interest adjustment at 8.5% on (1), (2), and (3) to December 31, 2006	$15,764,199
(5)	Expected market value on January 1, 2007 (1) + (2) + (3) + (4)	$214,834,907
(6)	Actual market value on January 1, 2006	$225,054,924
(7)	2006 (Gain) / Loss	($10,220,017)
(8)	80% of 2006 (Gain) / Loss	($8,176,013)
(9)	2005 (Gain) / Loss	$249,195
(10)	60% of 2005 (Gain) / Loss	$149,517
(11)	2004 (Gain) / Loss	($3,426,404)
(12)	40% of 2004 (Gain) / Loss	($1,370,562)
(13)	2003 (Gain) / Loss	($19,710,775)
(14)	20% of 2003 (Gain) / Loss	($3,942,155)
(15)	Actuarial value on January 1, 2007, (6) + (8) + (10) + (12) + (14) but not less than 90% nor greater than 110% of (6)	$211,715,711
(16)	Ratio of actuarial value to market value	94.07%
(17)	Actuarial Value Return for 2005	6.79%
(18)	Actuarial Value Return for 2006	9.91%
(19)	Market Value Return for 2005	7.86%
(20)	Market Value Return for 2006	13.19%

Unfunded Actuarial Accrued Liabilities

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

Table VI

	January 1, 2005	January 1, 2007
Actuarial Accrued Liability	$206,348,711	$255,961,699
Actuarial Assets	172,511,736	211,715,711
Unfunded Actuarial Accrued Liability	$33,836,975	$44,245,988
Funded Status	83.6%	82.7%

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Appropriations

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2028, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the unfunded actuarial accrued liability by June 30, 2024
  $ 44,245,988 over 17 years with 4.5% increasing payments
- Interest adjustment for payments contributed monthly over fiscal year.

The pension appropriation is shown in Table VII.

Table VII

	January 1, 2005	January 1, 2007
Normal cost	$1,430,121	$1,415,227
Amortization payment of the prior accrued liability	2,272,346	3,343,823
Total cost	$3,702,467	$4,759,050
% of Pay	5.6%	6.3%
Fiscal 2008 cost	$4,233,329	$4,233,329
Fiscal 2009 cost	$4,381,285	$5,314,218

Appropriation Forecast

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2028 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be made at the beginning of the year.

The employer total cost is expected to increase during the next 10 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents 5.6% of payroll, decreasing to 1.0% by the time the unfunded liabilities are fully paid off. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

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Appropriation Forecast

Fiscal Year Ending	Payroll*	Employee Contribution	Employer Normal Cost with Interest	Amortization Payments with Interest	Employer Total Cost with Interest	Employer Total Cost % of Payroll	Funded Ratio %**
2008	$75,444,127	$6,527,514	$1,523,178	$2,710,151	$4,233,329	5.6	82.7
2009	$80,838,498	$7,068,931	$1,477,458	$3,836,760	$5,314,218	6.6	83.7
2010	$86,664,652	$7,658,473	$1,577,354	$4,009,414	$5,586,768	6.4	84.9
2011	$92,740,839	$8,281,107	$1,595,722	$4,189,838	$5,785,560	6.2	86.1
2012	$99,096,740	$8,940,204	$1,606,539	$4,378,380	$5,984,919	6.0	87.3
2013	$105,674,008	$9,631,222	$1,608,084	$4,575,407	$6,183,491	5.9	88.3
2014	$112,568,651	$10,363,612	$1,601,063	$4,781,301	$6,382,364	5.7	89.4
2015	$119,778,727	$11,138,075	$1,584,501	$4,996,459	$6,580,960	5.5	90.4
2016	$127,136,442	$11,939,727	$1,555,406	$5,221,300	$6,776,706	5.3	91.3
2017	$134,694,863	$12,774,009	$1,513,934	$5,456,259	$6,970,193	5.2	92.3
2018	$142,437,038	$13,639,854	$1,459,312	$5,701,790	$7,161,102	5.0	93.2
2019	$149,995,274	$14,502,222	$1,387,590	$5,958,371	$7,345,961	4.9	94.1
2020	$157,636,507	$15,386,658	$1,301,522	$6,226,497	$7,528,019	4.8	95.0
2021	$165,461,545	$16,303,325	$1,201,591	$6,506,690	$7,708,281	4.7	95.9
2022	$173,334,363	$17,239,203	$1,086,397	$6,799,491	$7,885,888	4.5	96.8
2023	$181,301,070	$18,199,054	$956,040	$7,105,468	$8,061,508	4.4	97.8
2024	$189,120,784	$19,158,736	$809,210	$7,425,214	$8,234,424	4.4	98.9
2025	$196,816,634	$20,120,205	$646,421	$0	$646,421	0.3	100.0
2026	$204,270,102	$21,070,893	$467,771	$0	$467,771	0.2	100.0
2027	$211,561,184	$22,018,454	$274,087	$0	$274,087	0.1	100.0
2028	$218,749,749	$22,968,724	$65,871	$0	$65,871	0.0	100.0
2029	$226,162,495	$23,747,062	$68,103	$0	$68,103	0.0	100.0
2030	$234,314,214	$24,602,992	$70,558	$0	$70,558	0.0	100.0
2031	$242,791,178	$25,493,074	$73,110	$0	$73,110	0.0	100.0
2032	$251,650,396	$26,423,292	$75,778	$0	$75,778	0.0	100.0
2033	$261,151,897	$27,420,949	$78,639	$0	$78,639	0.0	100.0
2034	$270,934,677	$28,448,141	$81,585	$0	$81,585	0.0	100.0
2035	$281,988,249	$29,608,766	$84,913	$0	$84,913	0.0	100.0
2036	$293,706,276	$30,839,159	$88,442	$0	$88,442	0.0	100.0
2037	$306,176,997	$32,148,585	$92,197	$0	$92,197	0.0	100.0
2038	$319,833,160	$33,582,482	$96,309	$0	$96,309	0.0	100.0

* Calendar basis

** Beginning of Fiscal Year

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GASB Statements No. 25 and No. 27

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to $0. The required disclosure information is shown in Table VIII.

Table VIII

		January 1, 2005	January 1, 2007
(1)	Actuarial Accrued Liability	$206,348,711	$255,961,699
(2)	Actuarial Value of Assets	172,511,736	211,715,711
(3)	Unfunded Actuarial Accrued Liability	33,836,975	44,245,988
(4)	Funded Ratio (2)/(1)	83.6%	82.7%
(5)	Covered Payroll	$65,789,878	$75,444,127
(6)	UAAL as a percentage of payroll: (3)/(5)	51.4%	58.6%
(7)	Annual Required Contribution (ARC)	$3,984,886	$4,233,329
(8)	Net Pension Obligation	$0	$0

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PERAC Annual Statement
APPENDIX PAGE 3
ACTUARIAL VALUATION AND ASSUMPTIONS

The most recent actuarial valuation of the System was prepared by Buck Consultants as of January 1, 2007.

The normal cost for employees on that date was:	$6,527,514	8.7% of pay
The normal cost for the employer was:	1,415,227	1.9% of pay

The actuarial liability for active members was:	$186,408,780
The actuarial liability for retired and inactive members was:	69,552,919
Total actuarial accrued liability:	255,961,699
System assets as of that date:	211,715,711
Unfunded actuarial accrued liability:	$44,245,988

The ratio of system's assets to total actuarial liability was 82.7%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	8.0%
Rate of Salary Increase:	4.8%

SCHEDULE OF FUNDING PROGRESS ($,000)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded Actuarial Accrued Liability (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a percent of Covered Payroll (b-a)/c
01/01/07	$211,716	$255,962	$44,246	82.7%	$75,444	58.6%
01/01/05	172,512	172,512	0	100.0%	65,790	0.0%
01/01/03	146,188	146,188	0	100.0%	66,711	0.0%
01/01/02	141,069	141,069	0	100.0%	66,322	0.0%
01/01/01	128,385	128,385	0	100.0%	65,955	0.0%
01/01/99	96,318	96,318	0	100.0%	66,782	0.0%

Attach Copy of Current Approved Funding Schedule

EXHIBITS

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Age/Service Distribution with Salary as of January 1, 2007

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0
20-24	3	0	0	0	0	0	0	0	0	3
	35,387	0	0	0	0	0	0	0	0	35,387
25-29	10	1	0	0	0	0	0	0	0	11
	39,788	46,161	0	0	0	0	0	0	0	40,367
30-34	15	14	10	0	0	0	0	0	0	39
	45,593	53,409	55,389	0	0	0	0	0	0	50,911
35-39	11	28	40	27	0	0	0	0	0	106
	57,924	52,092	60,848	53,733	0	0	0	0	0	56,419
40-44	20	25	54	92	13	0	0	0	0	204
	51,597	66,106	63,297	64,509	54,103	0	0	0	0	62,455
45-49	16	25	49	116	31	3	0	0	0	240
	53,791	59,956	65,121	65,662	65,442	62,157	0	0	0	64,093
50-54	21	26	60	95	21	10	2	0	0	235
	63,150	62,309	67,951	66,422	71,117	100,808	70,485	0	0	67,982
55-59	10	19	27	77	22	10	3	1	0	169
	46,106	72,192	66,377	70,247	65,404	82,858	67,357	55,353	0	68,395
60-64	3	9	25	29	14	6	0	2	0	88
	40,249	55,282	59,517	63,543	83,457	76,903	0	74,948	0	65,099
65-69	4	2	9	8	3	0	0	0	0	26
	52,669	55,264	67,197	53,118	61,679	0	0	0	0	59,075
70+	0	1	0	2	1	0	1	1	0	6
	0	76,127	0	36,397	51,804	0	89,055	133,912	0	70,615
Total Employees	113	150	274	446	105	29	6	4	0	1,127
Average Salary	51,649	60,533	64,083	65,161	67,330	85,674	72,016	84,790	0	63,765

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Retiree Distribution as of January 1, 2007

	Number of Employees			Total Payments		
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	1	2	3	12,271	35,948	48,220
55-59	18	12	30	614,730	176,726	791,456
60-64	50	22	72	1,250,873	414,921	1,665,795
65-69	39	21	60	867,257	372,938	1,240,195
70-74	36	12	48	835,858	167,795	1,003,653
75-79	13	3	16	232,251	81,539	313,790
80-84	5	2	7	85,884	24,502	110,386
85-89	0	0	0	0	0	0
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	162	74	236	3,899,124	1,274,371	5,173,495
Average (Age/Payment)	67	65.7	66.6	24,069	17,221	21,922
Frequency Percent	68.6	31.4	100	75.4	24.6	100

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Disabled Retiree Distribution as of January 1, 2007

	Number of Employees			Total Payments		
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	4	1	5	108,347	53,379	161,725
45-49	2	2	4	36,577	48,131	84,707
50-54	5	1	6	141,725	47,758	189,483
55-59	8	0	8	205,957	0	205,957
60-64	5	2	7	169,502	42,671	212,173
65-69	0	0	0	0	0	0
70-74	0	0	0	0	0	0
75-79	1	0	1	23,829	0	23,829
80-84	0	0	0	0	0	0
85-89	0	0	0	0	0	0
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
Total	25	6	31	685,937	191,938	877,874
Average (Age/Payment)	55.2	52.2	54.6	27,437	31,990	28,319
Frequency Percent	80.6	19.4	100.0	78.1	21.9	100.0

EXHIBIT 4 - CASHFLOW FORECAST:

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year Ending	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	Net change in plan assets
2007	$8,483,180	$6,527,514	$4,233,329	$17,073,271	$19,350,934
2008	9,500,012	7,068,931	5,314,218	18,702,341	21,585,478
2009	10,692,959	7,658,473	5,586,768	20,430,747	22,983,030
2010	12,136,444	8,281,107	5,785,560	22,263,532	24,193,755
2011	13,930,923	8,940,204	5,984,919	24,182,337	25,176,538
2012	15,883,183	9,631,222	6,183,491	26,176,139	26,107,669
2013	18,176,688	10,363,612	6,382,364	28,234,367	26,803,655
2014	20,766,941	11,138,075	6,580,960	30,340,013	27,292,107
2015	23,628,603	11,939,727	6,776,706	32,476,267	27,564,097
2016	26,878,047	12,774,009	6,970,193	34,621,684	27,487,839
2017	30,631,200	13,639,854	7,161,102	36,743,773	26,913,529
2018	34,951,672	14,502,222	7,345,961	38,797,379	25,693,889
2019	39,582,479	15,386,658	7,528,019	40,743,011	24,075,209
2020	44,581,092	16,303,325	7,708,281	42,547,311	21,977,825
2021	49,934,026	17,239,203	7,885,888	44,171,466	19,362,531
2022	55,717,180	18,199,054	8,061,508	45,571,452	16,114,834
2023	61,785,998	19,158,736	8,234,424	46,700,413	12,307,575
2024	68,094,080	20,120,205	646,421	47,476,983	149,529
2025	74,423,364	21,070,893	467,771	47,316,082	(5,568,618)
2026	80,599,883	22,018,454	274,087	46,703,419	(11,603,923)
2027	86,484,991	22,968,724	65,871	45,619,532	(17,830,864)
2028	91,739,819	23,747,062	68,103	44,049,188	(23,875,466)
2029	96,551,442	24,602,992	70,558	42,018,871	(29,859,021)
2030	100,851,226	25,493,074	73,110	39,532,683	(35,752,359)
2031	104,667,676	26,423,292	75,778	36,597,199	(41,571,407)
2032	108,076,153	27,420,949	78,639	33,217,593	(47,358,972)
2033	110,797,563	28,448,141	81,585	29,404,298	(52,863,539)
2034	113,045,091	29,608,766	84,913	25,179,906	(58,171,506)
2035	114,857,148	30,839,159	88,442	20,553,540	(63,376,007)
2036	118,712,171	32,148,585	92,197	15,436,993	(71,034,396)

amounts in thousands

EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2007, and does not take into account any subsequent changes.

1. Administration

Each of the 107 contributory retirement systems for public employees of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

(i) Group 1: Most general employees in State and local government

(ii) Group 2: Certain specified hazardous duty positions

(iii) Group 3: State police officers and inspectors

(iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

3. Salary

Salary is defined as gross regular compensation. Salary does not include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

4. Member Contributions

Member contributions vary depending upon date hired as follows:

Date of Hire	Member Contribution Rate
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of $30,000

5. Average Salary

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.)

6. Creditable Service

In general, creditable service is awarded during the period in which a member contributes to the retirement system.

7. Service Retirement

a. Eligibility:

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

(i) completion of 20 years of service

(ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member

(iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service

b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table:

Age at	Percentage of Average Salary		
Retirement	Group 1	Group 2	Group 4
65 or Over	.025	.025	.025
64	.024	.025	.025
63	.023	.025	.025
62	.022	.025	.025
61	.021	.025	.025
60	.020	.025	.025
59	.019	.024	.025
58	.018	.023	.025
57	.017	.022	.025
56	.016	.021	.025
55	.015	.020	.025
54	.014	.014	.024
53	.013	.013	.023
52	.012	.012	.022
51	.011	.011	.021
50	.010	.010	.020
49	.009	.009	.019
48	.008	.008	.018
47	.007	.007	.017
46	.006	.006	.016
45	.005	.005	.015
44	.004	.004	.004
43	.003	.003	.003
42	.002	.002	.002
41	.001	.001	.001

8. Deferred Vested Retirement

a. Eligibility:

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

b. Benefit Amount:

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

c. Refund of Contributions:

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

9. Accidental Disability

a. Eligibility:

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

b. Benefit Amount:

The accidental disability amount is 72% of annual salary plus $648.48 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

10. <u>Ordinary Disability</u>

a. <u>Eligibility</u>:

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

b. <u>Benefit Amount</u>:

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

11. <u>Survivor Benefits</u>

a. <u>Occupational Death</u>:

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

b. <u>Non-Occupational Death</u>:

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of $250 per month to the surviving spouse, plus $120 for the first child, plus $90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of $250 per month plus $120 for the first child and $90 for each additional child.

c. Refund of Contributions:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

12. Cost-of-Living Increases

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is $12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

13. Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

(i) Option A – Life annuity

(ii) Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member

(iii) Option C – Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

EXHIBIT 6 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

1. Member Data

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

2. Valuation Date

January 1, 2007.

3. Actuarial Cost Method

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

4. Rate of Investment Return

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.0% per annum.

5. Cost-of-Living Increases

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and $12,000 per year.

6. Salary Scale

The assumed annual rates for salary increases including longevity are illustrated by the following rates:

Years of Service	Salary Scale
0	7.00%
1	6.50
2	6.50
3	6.00
4	6.00
5	5.50
6	5.50
7	5.00
8	5.00
9+	4.75

7. Value of Investments

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC). Actuarial assets equal preliminary asset value plus 25% of the difference between market value and preliminary asset value. Preliminary asset value is the previous years' actuarial asset amount increased by net cash flow and expected investment income. The result must be within 20% of market value.

8. Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

Service	General Employees
0	0.1500
10	0.0540
20	0.0200
30	0.0000

9. Annual Rate of Mortality

It is assumed that both pre-retirement and post retirement mortality are represented by the RP-2000 Mortality Table for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members.

10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

Age	Male General Employees	Female General Employees
50	0.0100	0.0150
51	0.0100	0.0150
52	0.0100	0.0200
53	0.0100	0.0250
54	0.0200	0.0250
55	0.0200	0.0550
56	0.0250	0.0650
57	0.0250	0.0650
58	0.0500	0.0650
59	0.0650	0.0650
60	0.1200	0.0500
61	0.2000	0.1300
62	0.3000	0.1500
63	0.2500	0.1250
64	0.2200	0.1800
65	0.4000	0.1500
66	0.2500	0.2000
67	0.2500	0.2000
68	0.3000	0.2500
69	0.3000	0.2000
70	1.0000	1.0000

11. Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

Attained Age	General Employees
20	0.0001
30	0.0003
40	0.0010
50	0.0019

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected).

12. Family Composition

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

13. Administrative Expenses

No provision is made for anticipated administrative expenses.

EXHIBIT 7 – GLOSSARY OF TERMS:

This glossary summarizes the technical terms contained in this report.

1. <u>Actuarial Accrued Liability</u>

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

2. <u>Actuarial Assumptions</u>

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

3. <u>Actuarial Cost Method</u>

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

4. <u>Actuarial Present Value</u>

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

5. <u>Forecast</u>

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

6. **Normal Cost**

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

7. **Unfunded Actuarial Accrued Liability**

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

8. **Valuation Method**

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

9. **Vested Liability**

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

CERTIFICATION:

This report fairly represents the actuarial position of the Massachusetts Water Resources Authority Retirement System contributing as of January 1, 2007, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

Buck Consultants, LLC

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Enrolled Actuary No. 05-4086

November 2007